

Incident Summary (5612954)

SUPPORTING INFORMATION	Incident Date		December 2016	
	Location		Mission	
	Regulated industry sector		Low voltage electrical system (30V to 750V)	
	Impact	Injury	Qty injuries	1
			Injury description	An occupant of a house received an electrical shock.
			Injury rating	Minor
	Damage		Damage description	n/a
			Damage rating	None
Incident rating		Minor		
Incident overview		An occupant received an electrical shock while plugging in a cell phone charger to a receptacle in the bedroom of a house. The shock was described as minor by the occupant and no medical treatment was received.		
INVESTIGATION CONCLUSIONS	Site, system and components		<p>Receptacles are required to be secured to the outlet boxes that they are connected to and wiring entering outlet boxes is required to be properly installed. This is required to provide support for the receptacle when plugging in and unplugging cords, to enclose the energized terminals and conductors so they are not damaged or contacted, and to contain thermal energy if the wiring, connections, or receptacle fails.</p> <p>Receptacles that are not properly secured to outlet boxes and do not have cover plates installed are subject to accidental contact by persons and objects and present a shock and fire hazard.</p>	
	Failure scenario(s)		<p>A 15 amp 120 volt rated receptacle in a house was not secured to the outlet box that it was connected to.</p> <p>When plugging in and unplugging a cell phone charger the occupant of the house was holding onto the receptacle with one hand and plugging in the charger with the other. The receptacle connection terminals were exposed at the sides of the receptacle.</p> <p>When the occupant held onto the receptacle he contacted the energized terminal and the neutral or bonding terminals located on opposite sides of the receptacle.</p> <p>He received a 120V shock to his hand which made him quickly pull his hand away from the receptacle.</p>	
	Facts and evidence		<p>Interview with the person that reported the incident indicated the following:</p> <ul style="list-style-type: none"> - Her son in-law was shocked while plugging his cell phone charger into a receptacle. - The receptacle in his bedroom was not fastened to the outlet box and was hanging from the wiring. - The owner of the house was contacted and he came to the house but did not fix it properly. The receptacle was still not secured to the outlet box and was hanging from the wiring. - She had concerns about other issues with the electrical system in the house that she and her family are renting. 	

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	<p>Interview with the person that received the shock indicated the following:</p> <ul style="list-style-type: none"> - He received a shock the first time in early December of 2016 shortly after they moved into the house. - He received the shock while holding onto the receptacle with one hand and plugging his cell phone charger in with the other hand. - The receptacle was not secured to the outlet box and the connection terminals on the side of the receptacle were exposed. - After the incident the owner was notified and came and put some tape around the receptacle but did not secure the receptacle to the outlet box. - He received another shock in January of 2017. - He installed additional electrical tape around the receptacle himself which prevented him from getting shocked again. - He indicated that during the shock he experienced discomfort but he did not require medical attention and was not permanently injured. <p>Interview with the owner of the house indicated the following:</p> <ul style="list-style-type: none"> - He has owned the house for approximately 13 -14 years. - He was aware of the incident. - Over the years he has had some wiring fixed and added to the house because it is very old. - He was aware that there was some unsafe wiring in the house and had intended to get it fixed but had not got around to it yet. <p>Observations of the receptacle, outlet box, and wiring after the incident:</p> <ul style="list-style-type: none"> - The 15A 120V receptacle located in the upper floor bedroom was not secured to the outlet box. - Electrical tape had been wrapped around the side of the receptacle to cover the exposed energized terminals. - A non-metallic sheathed cable was improperly entered into the outlet box near the front edge at the bottom of the box. This improper wiring installation may have impeded efforts to install the receptacle onto the box because of its location. - Inspection of the house's electrical system identified multiple unsafe and non-compliant items.
<p>Causes and contributing factors</p>	<p>The cause of this incident is very likely the improper installation of a receptacle and the wiring connected to it. Wiring was not installed into the outlet box properly and the receptacle was not secured to the outlet box. Energized terminals on the side of the receptacle were exposed to contact. This made plugging into the receptacle difficult unless the receptacle was held in one hand while the other hand plugged in the cord/device.</p> <p>Failure of the occupant to recognize the hazard and avoid contact with the receptacle was a contributing factor.</p> <p>Failure of the owner to have the receptacle and wiring properly installed and later failing to address the electrical safety hazard by having it properly fixed were also contributing factors.</p>



Figure 1

This photo shows the exterior of the house. The bedroom where the incident occurred is on the upper floor shown by the red arrow.

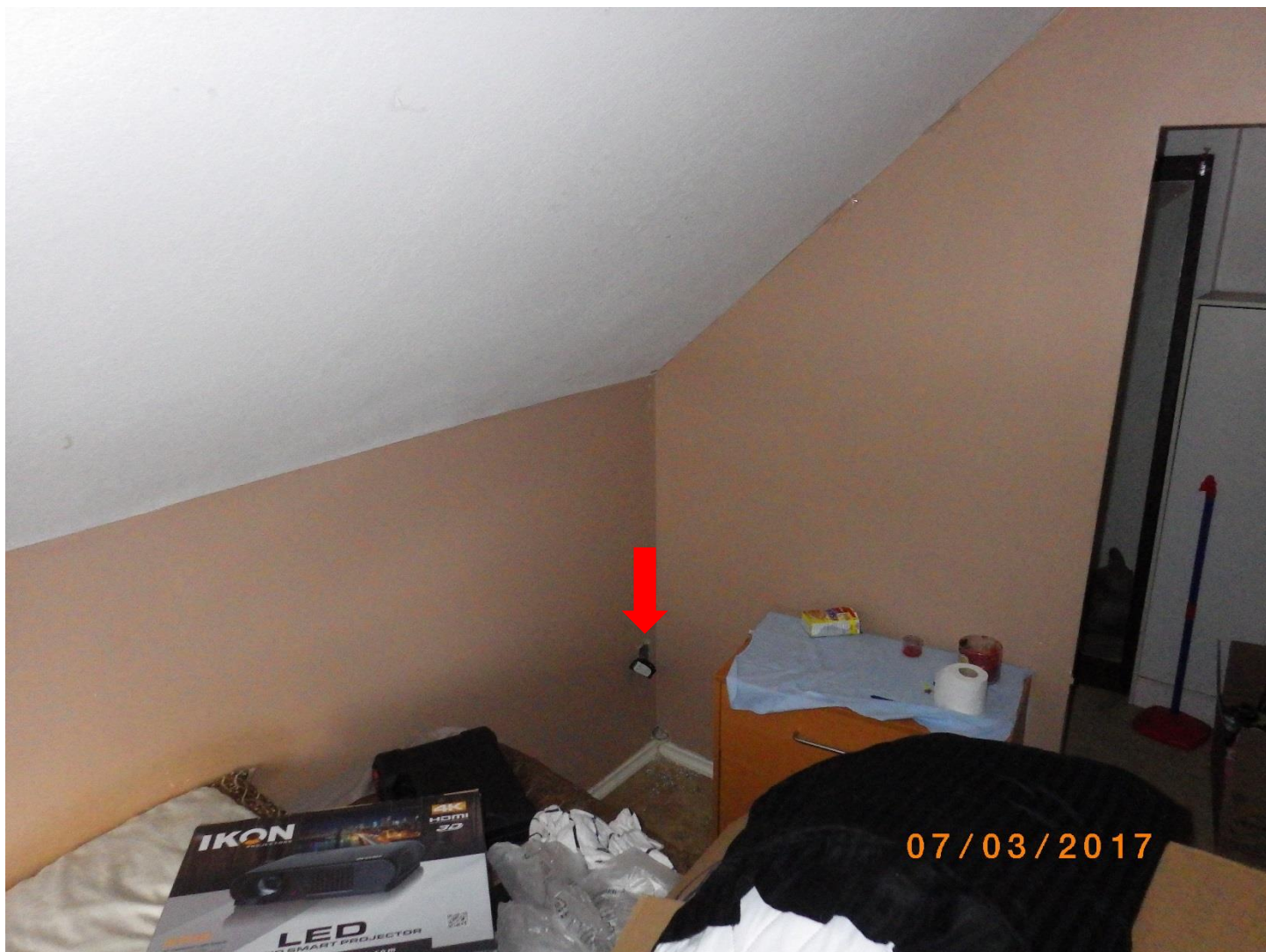


Figure 2

This photo shows the bedroom where the incident occurred. The red arrow shows the location of the receptacle where the occupant received the shock.



Figure 3

This photo shows the receptacle and the improperly installed non-metallic sheathed cable wiring connected to it. The red outline shows where the cable was fished through the wall and the red arrow shows where it entered the outlet box. The receptacle had tape wrapped around it that was installed by the owner and the tenant after the tenant received shocks from the bare terminals on the side of the receptacle.



Figure 4

The green light on my tester indicates the receptacle was energized when I went to the site.



Figure 5

This photo shows the receptacle and wiring connected to it. The red arrow shows the improperly installed cable that was not entered into the outlet box and was connected to the receptacle. The red outline shows where the metal box was notched to enter the cable into the box. This is not an approved method for entering a cable into an outlet box.



Figure 6

This photo shows an exemplar of the receptacle and the terminals located on the side of it that would have been contacted by the occupant that received the shock.